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**Title :** An Integrated Approach To Programming and Filtering Data From Satellite-linked Dive Recorders

**Category :** Ecology

**Student :** Not Applicable

**Preferred Format :** Poster Presentation

**Abstract :** Interpretation of marine mammal foraging behavior from satellite telemetry can be enhanced by maximizing the amount and quality of the location and dive data received combined with filtering procedures that detect implausible location fixes. We developed a transmission protocol for satellite dive recorders (SDRs) deployed on juvenile Steller sea lions (*Eumetopias jubatus*) to collect high-quality location data associated with six-hour sampling intervals that are defined by dive data summary periods. A stage-based filtering algorithm was also developed that used surface-timeline data to detect haul-out periods and iteratively evaluate the geometry and velocity of at-sea movements relative to predefined threshold values. The filter also considered Argos location class (LC) of adjacent locations as a factor in determining which locations to remove. After filtering, locations were sub-sampled at 6, 12 and 24-hour intervals based on Argos location quality, and the effect of sampling design and filter algorithm was assessed using Schoener's ratio of spatial autocorrelation. Unfiltered Argos data (n=30,847 locations) from 65 juvenile sea lions contained 33.7% standard quality (LC 1-3) locations. Filtering increased the proportion of standard quality locations to 46%, with additional increases at 6, 12 and 24-hour sub-sampling intervals to 64.7%, 74.1% and 81.5%, respectively. Schoener's ratio showed significant autocorrelation remaining for some individuals after sub-sampling at 6 hr intervals, with little change at 12 or 24-hour intervals, indicating marginal benefit in sub-sampling at greater than 6-hour intervals. Our results showed that the precision of satellite telemetry data was improved through integrated instrument programming and filtering. Variable levels of spatial autocorrelation in juvenile Steller sea lion movement paths after filtering were indicative of highly correlated movement patterns such as extended foraging trips or long transits between haul-out sites.